

register file interconnect in a processor, based on an input specification of register file types in the processor, specified processor operations, desired instruction level parallelism among specified operations and functional units in the processor,

the method comprising:

for each type of register file specified in the processor, establishing a set of read/write port requests between the functional units and each of the register file types;

programmatically computing a resource allocation of register ports in the register file types to read/write port requests, including determining how to share a register port for two or more functional unit ports based on the specification of instruction level parallelism among the specified processor operations; and

programmatically synthesizing register files with the allocated read/write ports and interconnects between the functional units and the allocated read/write ports.